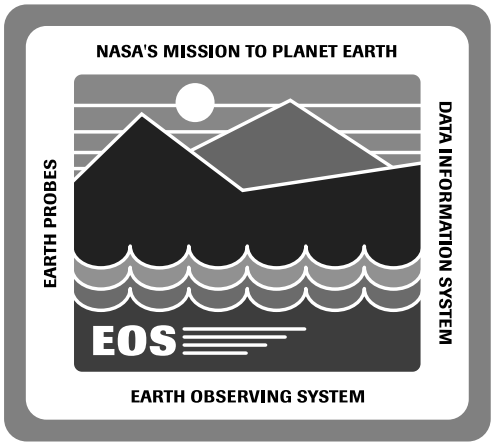
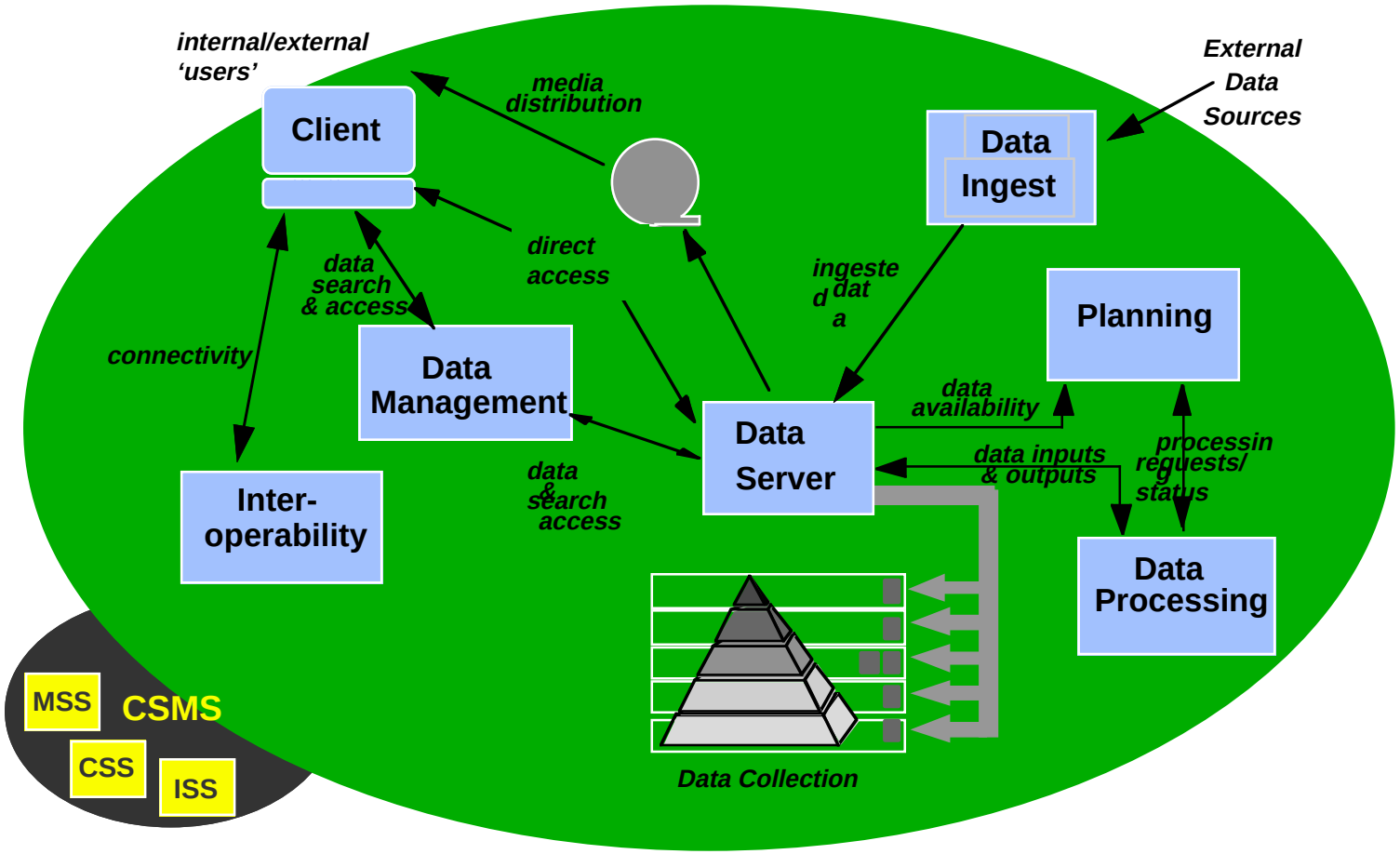


Planning Workbench Delta Detailed Design Review

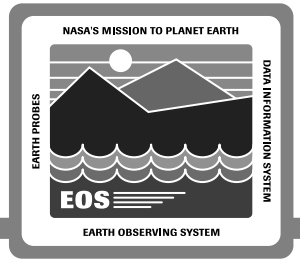
Karin Loya

27 September 1995

SDPS Subsystem



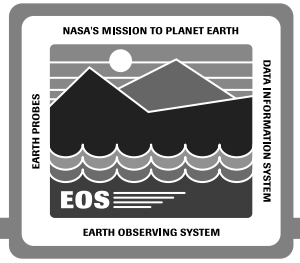
Introduction



AGENDA

- **Introduction**
- **Planning and Data Processing Subsystem (PDPS) Overview**
- **Science Planning and Production Scenarios**
- **Planning Workbench Design**
- **Planning Workbench Implementation Plan**

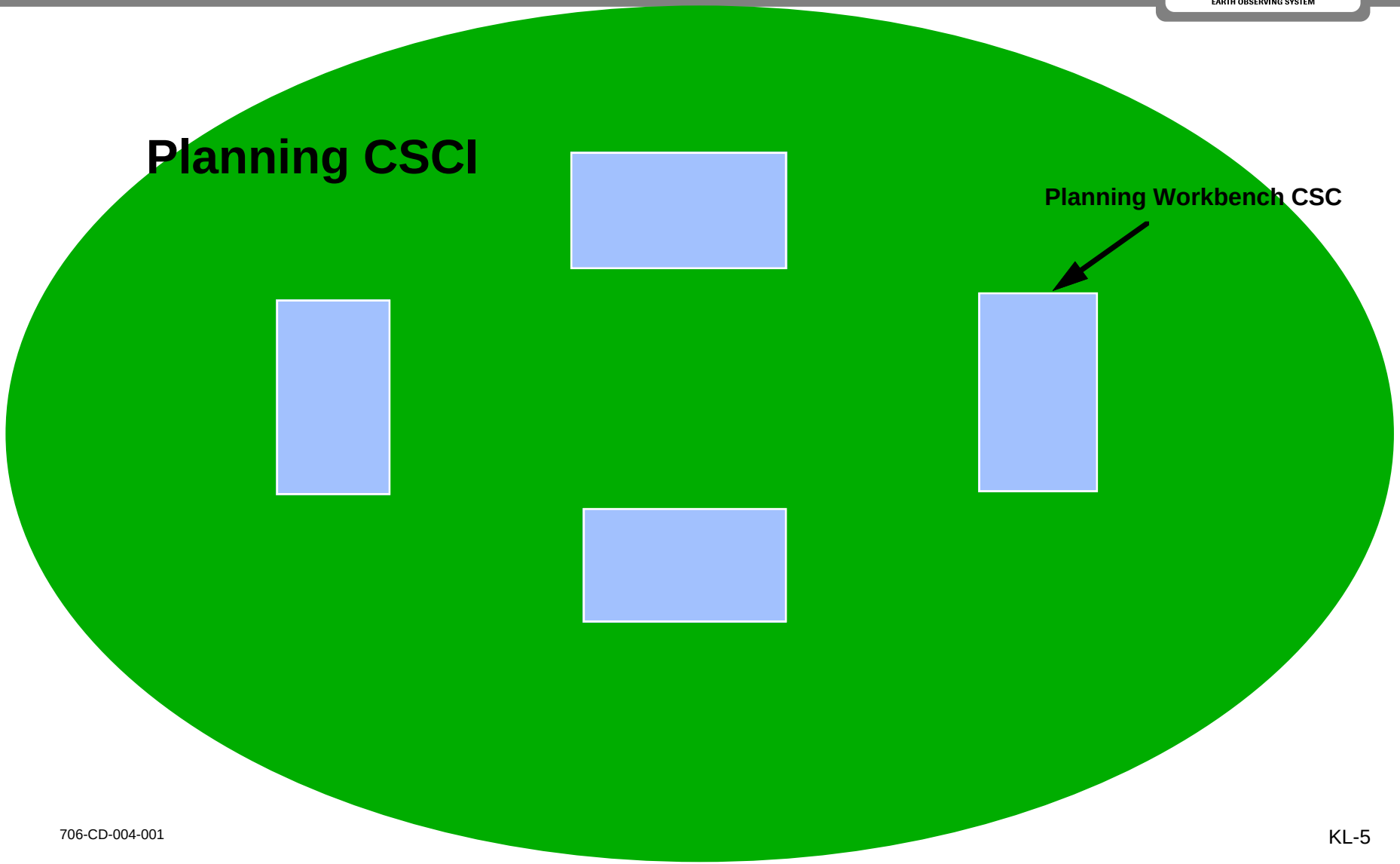
Introduction (cont.)



OBJECTIVES OF THE REVIEW

- **Present a Response to and Close ECS Release A CDR RID #15 (a priority 1)**
- **Present the Detailed Design for the *Planning Workbench CSC***
  - **Demonstrate a Clear Understanding of Release A Requirements Allocated to Planning Workbench**
  - **Demonstrate that the Design is Sufficient to Initiate Coding**

Planning Subsystem



Background

ECS RELEASE A CDR RID #15

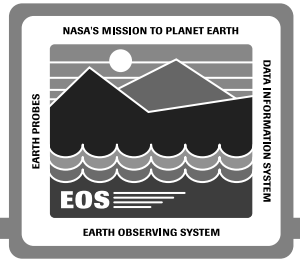
- **RID #15 submitted for Planning Workbench component**
- **Recommended prototyping/analysis of planning algorithm as provided by the AutoSys/AutoXpert COTS**

Note: AutoSys/AutoXpert COTS

- **was acquired July 1995 for Data Processing Subsystem's workload management and scheduling engine**
- **seemed to offer potential advantages as an alternative to Delphi-based design of Planning Workbench**

(Interoperability, Scalability, Evolvability)

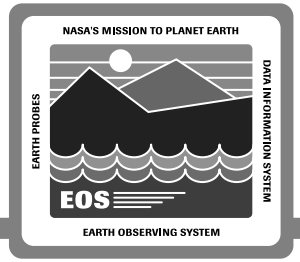
Background (cont.)



ECS RELEASE A CDR RID #15

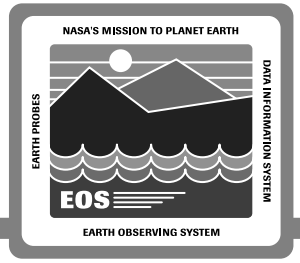
- **Recommended that an alternative COTS-based Planning Workbench design be prepared if results of the analysis favored the COTS implementation**
  - **Design of Planning Workbench to be completed in September**
  - **The Delta Detailed Design Review to be held in September would conclude the Planning Subsystem Design**

Outcome



- **AutoSys/AutoXpert seemed to provide Planning Workbench functionality**
- **Prototyping explored vendor-suggested workaround to extend AutoSys/AutoXpert functionality**
- **uncovered limitations in AutoXpert for Planning Workbench functionality**
  - **deficiencies in simulated resource loading**
  - **no “look ahead” capability**

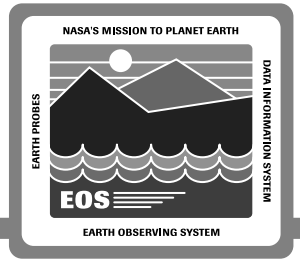
Planning Workbench Design



DESIGN TO BE PRESENTED

- reflects PDR and CDR baselines
- expands on design as documented in DID #305
- allows customization of the Planning Workbench GUI to meet ECS HMI guidelines
- supports scalability to Release B
  - evolution of the planning algorithm
  - cross-DAAC dependencies
  - on-demand production
  - Release B SMC requirements

Delphi-based Design

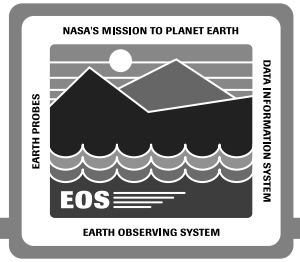


- **Planning Workbench design based on Delphi OTS C++ class libraries is a custom-solution which utilizes existing applicable building blocks (i.e., Planning Workbench object classes inherit from the Delphi classes)**

- **Delphi base provides resource management and timeline building blocks that are attractive for our Planning application; we would have to develop these from scratch w/o Delphi**

- **Delphi is a point of departure; but the main work of the Planning Algorithm is custom code**

PDPS Terminology



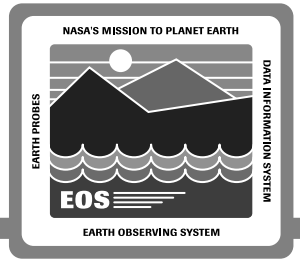
Production Request (PR) - The mechanism for a Production Planner or user to request product(s) be generated. Will lead to the creation of multiple Data Processing Requests (DPRs). A PR identifies a product to be produced and the time range that it should be produced for. A Production Request is contained in the PDPS Database.

Data Processing Request (DPR) - Generated by Planning Subsystem using a PR + information from the PGE Profile. One DPR corresponds to a single Product Generation Executive (PGE) to be executed.

A DPR includes a PGE, input data granule(s), output data granule(s) and archive location, planned start/end execution times, priority.

Product Generation Executive (PGE) - The smallest entity that may be scheduled and managed by Planning & Processing. Consists of one or more executables and scripts that may lead to the generation of standard data products.

PDPS Terminology (cont.)

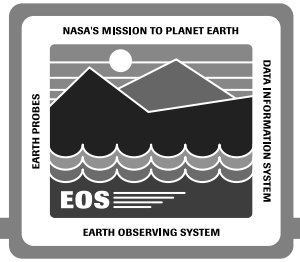


- ***PLAN*** **- A timeline which embodies the processing objectives for a particular time period**
  - **CANDIDATE PLAN - The result of "what if" planning by the Production Planner**
  - **ACTIVE PLAN - A Candidate Plan that has been selected and placed into execution by the Production Planner**

- ***SCHEDULE*** **- An ordered set of Data Processing Requests (DPRs) exported from Planning and imported into AutoSys. It is also a window into the active plan**

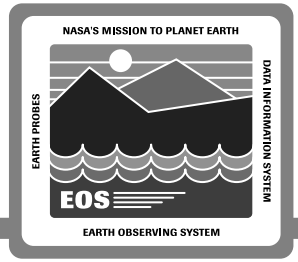
- ***GROUND EVENT*** **- Non-production processing event requiring allocation of resources (e.g. scheduled I&T time, down time scheduled for maintenance)**

PDPS Terminology (cont.)



- ***ROUTINE PROCESSING*** **- Pre-defined software production processing which is periodic and keyed to data arrival**
- ***RE-PROCESSING*** **- Repeat of Production Processing to generate a replacement product/products**
- ***ON-DEMAND PROCESSING*** **- Processing which is initiated by a user request**
- ***STAGING*** **- Process of copying available data from the Data Server to the Processing Subsystem disk drives**
- ***De-STAGING*** **- Process of copying PGE generated output from the Processing Subsystem disk drives to the Data Server**
- ***PREDICTIVE STAGING*** **- Process of performing some "look ahead" analysis to determine the "appropriate" time to stage data for a PGE**

Agenda



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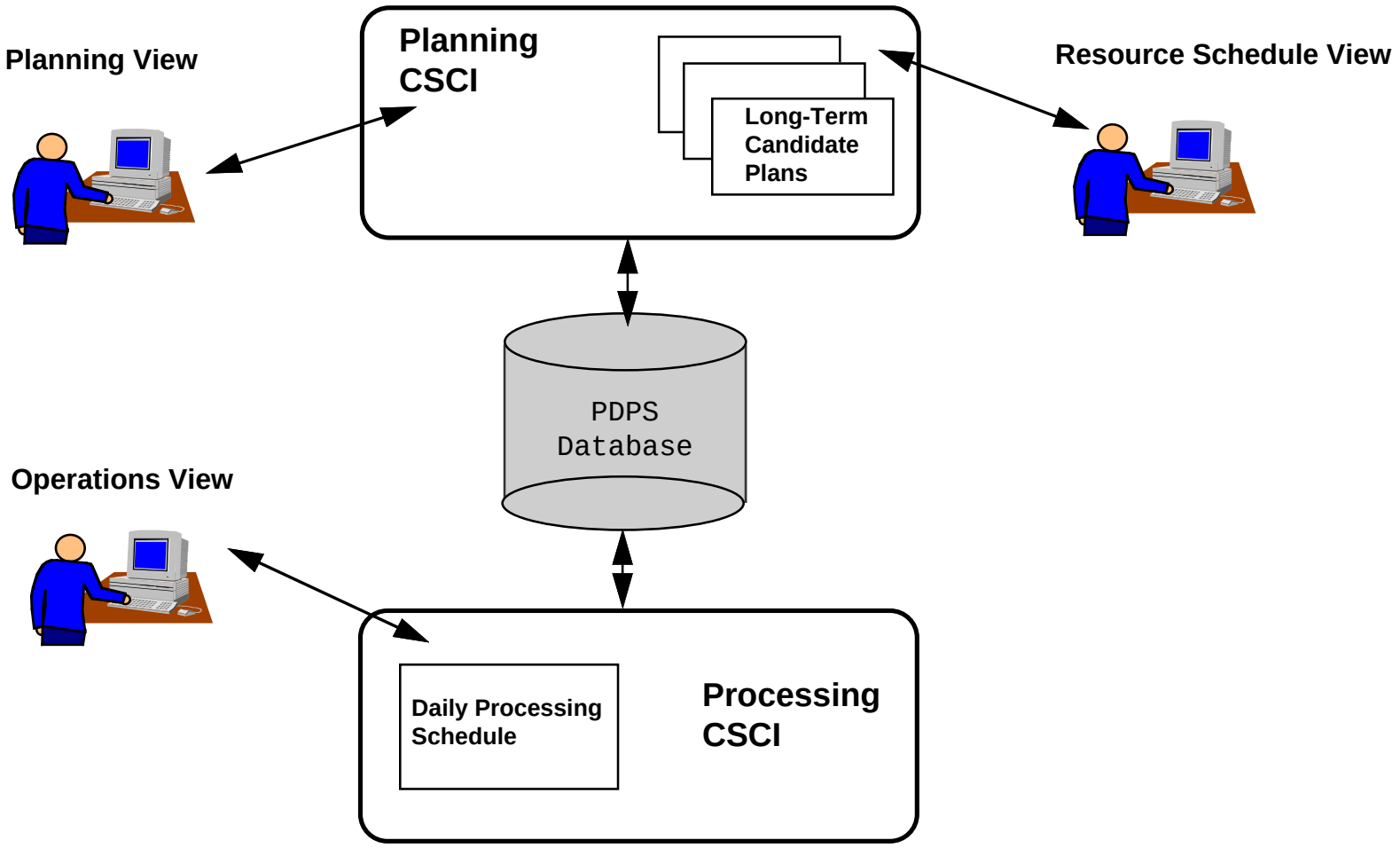
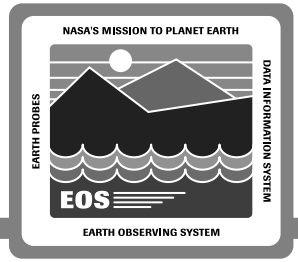
Planning and Data Processing



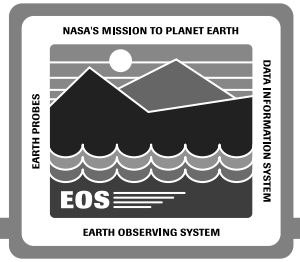
Planning Overview



Planning Subsystem provides the capabilities for

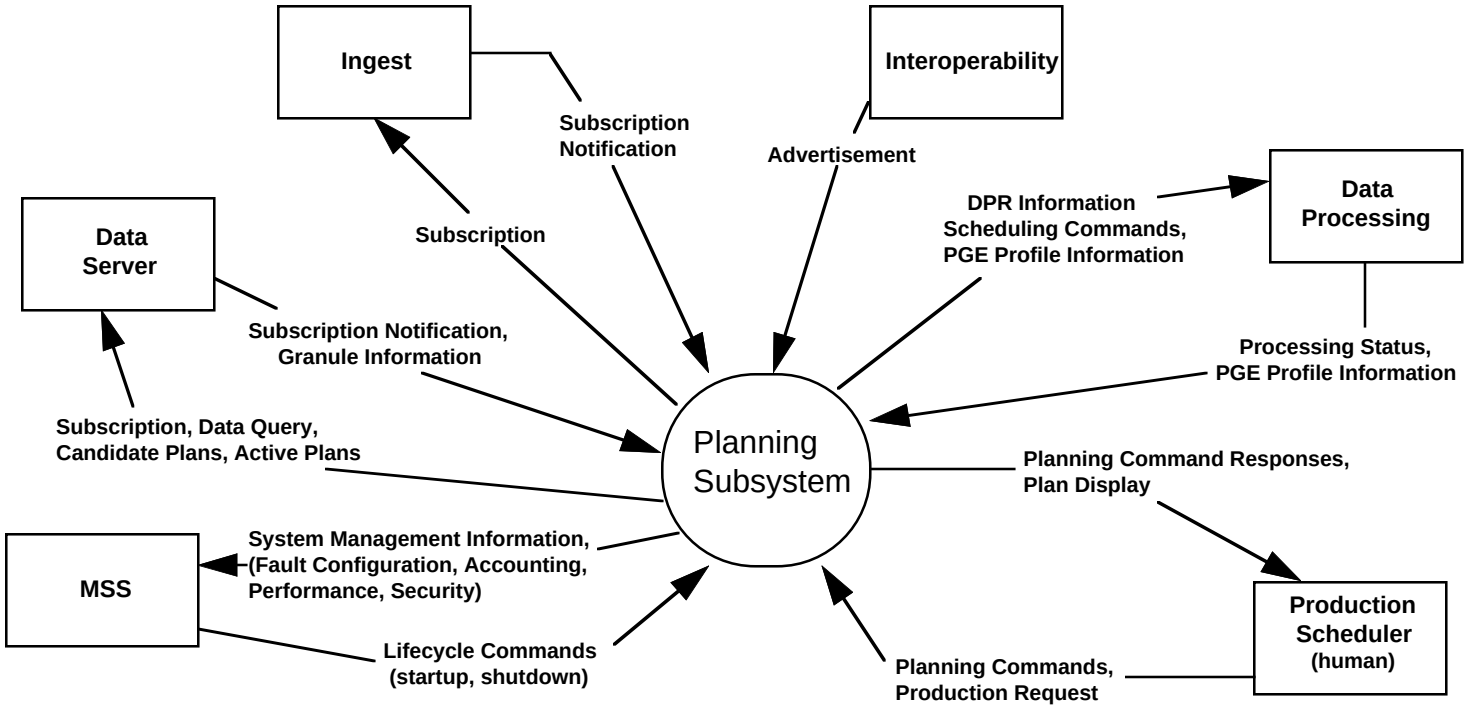
- **Describing Production Goals**
- **Preparing Resource Schedules for DAAC**
- **Forecasting Schedules for Production**
- **Coordinating the Production within ECS as Prescribed by Goals and Schedule**

Processing Overview

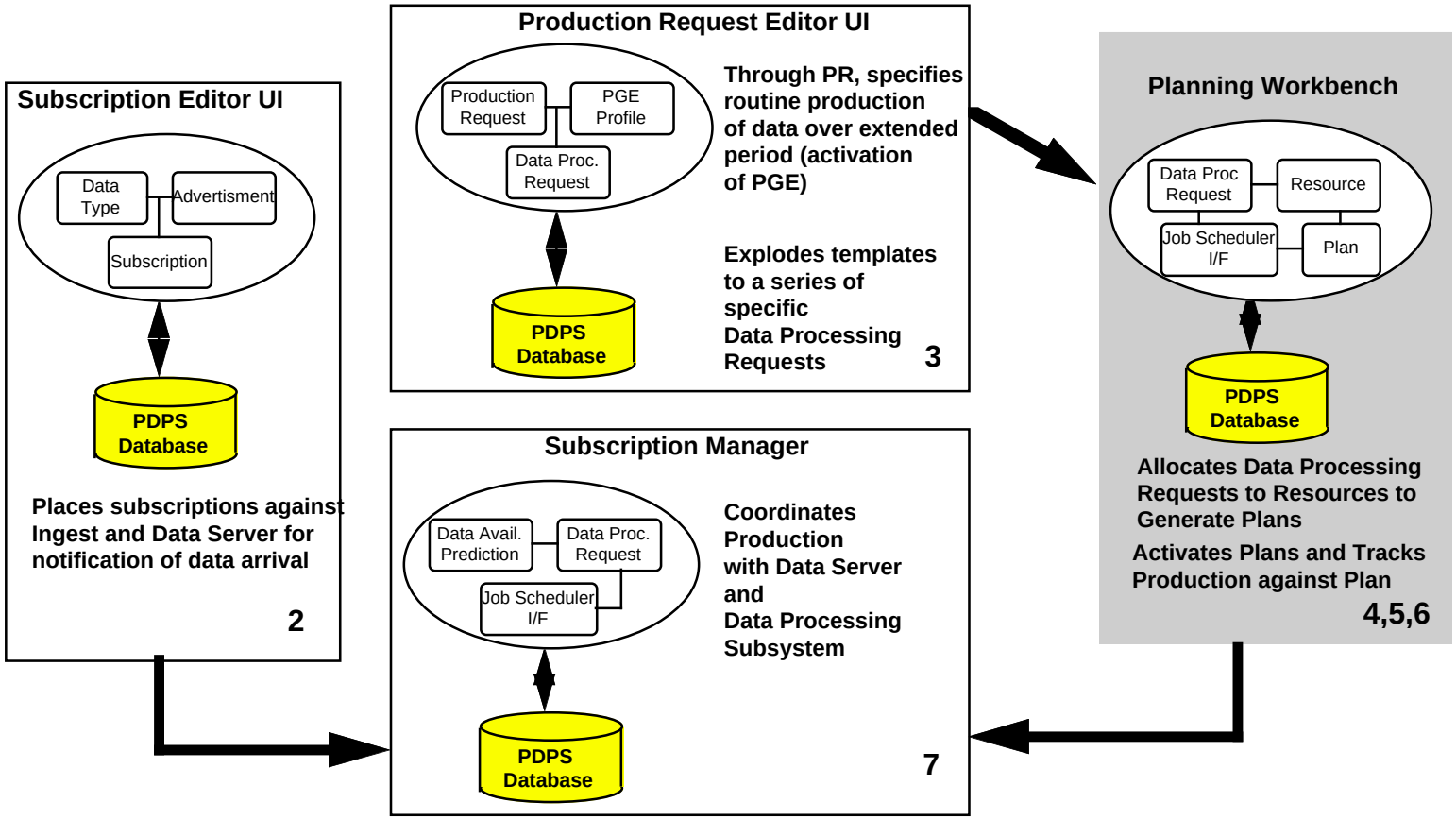


- **Manage and monitor the production of Science Data Products in a distributed, heterogeneous UNIX environment.**
- **Provide Operations Interfaces to allow intervention into automated production, when required.**
- **Provide interface to the Data Server to support staging and destaging of data.**
- **Provide fault and fault recovery capabilities to support science data production.**
- **Manage the use of Science Processing Hardware Resources to support Science Data production.**

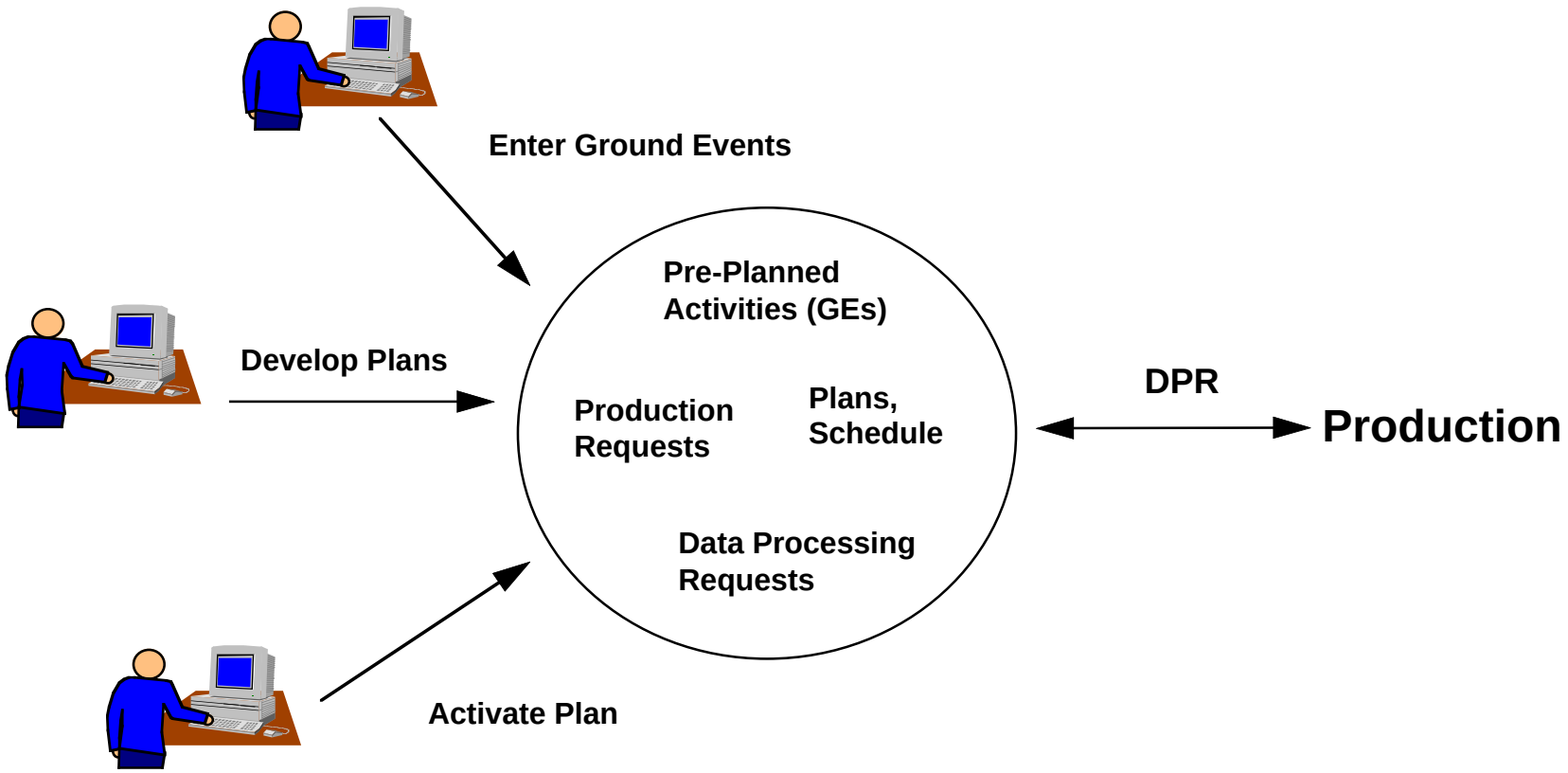
Context


Ingest
Interoperability
Subscription Notification
Advertisement
Data Server
Subscription
DPR Information
Scheduling Commands,
PGE Profile Information
Data Processing
Subscription Notification,
Granule Information
Processing Status,
PGE Profile Information
Subscription, Data Query,
Candidate Plans, Active Plans
Planning Subsystem
Planning Command Responses,
Plan Display
System Management Information,
(Fault Configuration, Accounting,
Performance, Security)
MSS
Production Scheduler
(human)
Lifecycle Commands
(startup, shutdown)
Planning Commands,
Production Request

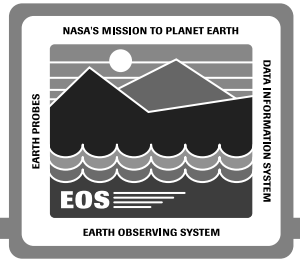
PLANG Component CSCs



Planning Workbench



Agenda



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